THE CRISUL REPEDE WATER QUALITY FEATURES FROM THE CRISURI HYDROGRAPHIC BASIN

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Abstract

The quality of the Crişul Repede water from the Crisuri hydrographic basin afferent to Bihor county has been followed all along the year 2011. The Crisul Repede waters have been analyzed based on their physical and chemical quality, on groups of indicators which are the following: the oxygen regime (CBO_5, CBO_{10}, CCO-Cr, dissolved oxygen, etc.), nutrients (nitrites, nitrogen, total nitrogen, ammonia nitrogen, phosphates, etc.), salinity (stable residue, chlorides, sulfates, bicarbonate, sodium, potassium., calcium, magnesium, etc.), specific toxic polluting agents of natural origin (arsenic, cadmium, cobalt, crom, copper, iron, manganese, nickel, zinc, etc.) and other relevant chemical indicators (phenols, detergents, etc.).

According to the following norms, the Water Law No. STAS 4706/88 and the MMGA Order No. 161/ 2006, the quality categories have been determined. The Rivers Water Basin Administration from Oradea does the following water quality classification according to the classes of quality: class I (very good estate), class II (good estate), class III (moderate estate), class IV (weak estate) and class V (bad estate).

During the year 2011 the estate of the Crisul Repede water quality has greatly belonged to class I quality, followed by class II of quality.

Key words: *salinity, toxic polluting agents, nutrients, quality, water.*

INTRODUCTION

Crişul Repede springs from the altitude of 680 m close to the Izvorul Crisului locality, from a hilly area, from the north edge of the Huedin Hollow.

The landforms that it crosses and through which it runs under the form of a large hollowy lane are: the Plopisului and Mesesului Mountains and Hills in the north, Vladeasa, Gilau, Padurea Craiului Mountains and Padurea Craiului Hills in the south and, in the west, the northern sector of the Rivers' Plane.

As a consequence of the fact that the majority of the tributaries are on the left side of the main water course (1618 km) the basin of Crisul Repede represents an asymmetry of 0.88 (Măhăra Gh., and collaborators., 1999, quoted by Moza Ana 2009).

In the Rivers' hydrographic basin The Crisul Repede river crosses 117 km from the limit of Bihor county until the border in Cheresig.

MATERIAL AND METHOD

The physical and chemical analysis of the water regarding the oxygen regime, the nutrients, the salinity, the natural toxic polluting agents as well as other relevant chemical indicators has been followed all over the year 2011 using data from the Rivers' Water Basin Administration, from Oradea.

RESULTS AND DISSCUSIONS

The surveillance sections in the quality classes according to the groups of indicators is framed as it follows:

Table 1

The length of the characterized section in relation with the the features registered at the group pf oxygen regime for the year 2011

Month	Section	Length (km)					
		Class I	Class II	Class III	Class IV	Class V	Total
January	County limit. – Cheresig border	117	-	-	-	-	117
February	County limit. – Cheresig border	117	-	-	-	-	117
March	County limit. – Cheresig border	114	3	-	-	-	117
April	County limit. – Cheresig border	117	-	-	-	-	117
May	County limit. – Cheresig border	114	3	-	-	-	117
June	County limit. – Cheresig border	117	-	-	-	-	117
July	County limit. – Cheresig border	117	-	-	-	-	117
August	County limit. – Cheresig border	97	20	-	-	-	117
September	County limit. – Cheresig border	117	-	-	-	-	117
October	County limit. – Cheresig border	97	20	-	-	-	117
November	County limit. – Cheresig border	117	-	-	-	-	117
December	County limit. – Cheresig border	117	-	-	-	-	117

Source: data processed after the Rivers Water Basin Administration, Oradea

In January and in February, on the whole length of 117 km, The Crisul Repede water quality for the oxygen regime indicator group belongs to class I of quality (table 1). In March the water quality belongs to class I of quality on a length of 114 km and the remaining segment of 3 km belongs to class II. In April the quality of the water belongs to class I on a length of 117 km and in May 114 km belong to class I and 3 km belong to class II.

In June and in July the quality belongs to class I all along the anlyzed length. In August and in October the Crisul Repede water quality belong to class I of quality for a length of 97 km and 20 km belong to class II of quality. Class I of quality is registered in September as well as in November and December.

Table 2

The length of the section characterized in relation with the registered features at the nutrients group for the year 2011

Month	Section	Length (km)					
		Class I	Class II	Class III	Class IV	Class V	Total
January	County limit. – Cheresig border	117	-	-	-	-	117
February	County limit. – Cheresig border	117	-	-	-	-	117
March	County limit. – Cheresig border	96	21	-	-	-	117
April	County limit. – Cheresig border	117	-	-	-	-	117
May	County limit. – Cheresig border	117	-	-	-	-	117
June	County limit. – Cheresig border	94	23	-	-	-	117
July	County limit. – Cheresig border	117	-	-	-	-	117
August	County limit. – Cheresig border	117	-	-	-	-	117
September	County limit. – Cheresig border	117	-	-	-	-	117
October	County limit. – Cheresig border	97	20	-	-	-	117
November	County limit. – Cheresig border	94	23	-	-	-	117
December	County limit. – Cheresig border	117	-	-	-	-	117

Source: data processed after the Rivers Water Basin Administration , Oradea

In the first two months of the year the Crisul Repede water quality for the nutrients group belongs to class I of quality for all the 117 km from the county limit to the border in Cheresig (table 2). In March 96 km belong to class I while 21 km belong to class II. In April and in May the water quality belongs to class I on the whole length of the studied section.

In June for 94 km the quality of the water belongs to class I and 23 km belong to class II. In July, August, September and December the water quality belongs to class I for all the length of the section from the county limit until the border in Cheresig. In October and in November the water quality according to the nutrients' indicator belongs both to class I of quality and to class II of quality.Thus, in October 97 km belong to class I and 20 km belong to class II. In November 94 km belong to class I and 23 km belong to class II.

Table 3

The length of the section characterized in relation with the features registered at the salinity group for the year 2011

Month	Section	Length (km)					
		Class I	Class II	Class III	Class IV	Class V	Total
January	County limit. – Cheresig border	117	-	-	-	-	117
February	County limit. – Cheresig border	117	-	-	-	-	117
March	County limit. – Cheresig border	96	21	-	-	-	117
April	County limit. – Cheresig border	117	-	-	-	-	117
May	County limit. – Cheresig border	117	-	-	-	-	117
June	County limit. – Cheresig border	94	23	-	-	-	117
July	County limit. – Cheresig border	117	-	-	-	-	117
August	County limit. – Cheresig border	117	-	-	-	-	117
September	County limit. – Cheresig border	117	-	-	-	-	117
October	County limit. – Cheresig border	97	20	-	-	-	117
November	County limit. – Cheresig border	94	23	-	-	-	117
December	County limit. – Cheresig border	117	-	-	-	-	117

Source: data processed after the Rivers Water Basin Administration, Oradea

In the salinity group the Crisul Repede water quality belongs, on the whole length of 117 km and all along 2011 to class I of quality from the county limit to the border in Cheresig (table 3).

Table 4

The length of the section characterized in relation with the features registered at the group of specific toxic polluting agents for the year 2011

Month	Section	Length (km)					
		Class I	Class II	Class III	Class IV	Class V	Total
January	County limit – Cheresig border	117	-	-	-	-	117
February	County limit – Cheresig border	117	-	-	-	-	117
March	County limit – Cheresig border	114	3	-	-	-	117
April	County limit – Cheresig border	117	-	-	-	-	117
May	County limit – Cheresig border	117	-	-	-	-	117
June	County limit – Cheresig border	117	-	-	-	-	117
July	County limit – Cheresig border	117	-	-	-	-	117
August	County limit – Cheresig border	117	-	-	-	-	117
September	County limit – Cheresig border	117	-	-	-	-	117
October	County limit – Cheresig border	117	-	-	-	-	117
November	County limit – Cheresig border	117	-	-	-	-	117
December	County limit – Cheresig border	117	-	-	-	-	117

Source: data processed after the Rivers Water Basin Administration, Oradea

On the length of the analyzed section, in January and in February, the quality of Crisul Repede water for the specific toxic polluting agents' group belongs to class I all along the whole length of the section (table 4). In March the water quality belongs to class I for 114 km and for 3 km it belongs to class II. The other months of the year belong to class I of quality on along the whole studied section.

Table 5

The length of the characterized section in relation with the features registered at the relevant chemical indicators for the year 2011

Month	Section	Length (km)					
		Class I	Class II	Class III	Class IV	Class V	Total
January	County limit – Cheresig border	-	117	-	-	-	117
February	County limit – Cheresig border	-	117	-	-	-	117
March	County limit – Cheresig border	114	3	-	-	-	117
April	County limit – Cheresig border	-	117	-	-	-	117
May	County limit – Cheresig border	-	117	-	-	-	117
June	County limit – Cheresig border	-	117	-	-	-	117
July	County limit – Cheresig border	-	117	-	-	-	117
August	County limit – Cheresig border	-	117	-	-	-	117
Septembrie	County limit – Cheresig border	-	117	-	-	-	117
Octombrie	County limit – Cheresig border	-	117	-	-	-	117
Noiembrie	County limit – Cheresig border	-	117	-	-	-	117
Decembrie	County limit – Cheresig border	-	117	-	-	-	117

Source: data processed after the Rivers Water Basin Administration, Oradea

In January and in February as well as in the interval April – December the Crisul Repede water quality, after the other relevant chemical indicators belongs to class II of quality all along the length of the section (table 5).

In March, on a distance of 114 km the water quality belongs to class I type of quality while a section of 3 km belong to class II of quality.

CONCLUSIONS

The quality of the Crisul Repede water along the year 2011 according to the indicator groups is framed as folows:

1. According to the oxygen regime the Crisul Repede waters belong in proportion of 97% to class I of quality and in proportion of over 3% to class II of quality.

2. After the nutrients, the Crisul Repede water quality belongs in proportion of 94% to class I of quality and in proportion of over 6% to class II of quality**.**

3. After the salinity regime the Crisul Repede water quality belongs 100 % to class I of quality**.**

4. After the specific toxic polluting agents' group, the Crisul Repede water belongs in proportion of 99.8% to class I of quality and in proportion of 0.2% to class II of quality**.**

5. After the other relevant chemical indicators' group, the Crisul Repede water belongs in proportion of 8% to class I of quality and in a proportion of 92% to class II of quality**.**

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